



TSURUMI PUMP

Application Reports - Issue No. 2 - December 2002

Tsurumi Manufacturing Co. is the world's biggest manufacturer of electrical submersible pumps.

Tsurumi's Kyoto Plant is the world's most modern submersible pump manufacturing plant.

Total manufacturing capability: 1.000.000 units per year.

Established in 1924 Tsurumi is one of the most experienced pump manufacturers.

Tsurumi is quality and durability.
Pumps for professional use.

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Technisches Hilfswerk
Ortsverband Köln-Ost
Offizieller Sponsor!



Airport link Cologne/Bonn



The Project:

Underground railway track to link the Cologne/Bonn airport

Executing companies:

**Consortium airport link Cologne/Bonn lot 3
Wayss & Freytag AG, E. Heitkamp GmbH,
Bauer Spezialtiefbau GmbH, F.C. Trapp AG**

The Problem:

A DB400 sewage water pipeline has to be installed through the progressing soil excavation.



Our Solution:

To re-pump the dirty water generated, submersible pumps for abrasive water of the types KRS65.5 and KTZ45.5 were installed in the existing shaft. Installation includes all hose connections and the emergency generator

In the event of abrasive and corrosive utilization, stronger wear and tear will take place naturally in certain components. With regards to the above application wear and tear can take place mainly in impeller, suction plate, shaft sleeve, oil ring, mechanical seal and strainer. Depending on the working conditions the lifetime of those parts might vary significantly and can be shorter than the legal warranty period.

In this regard, please pay attention to our general conditions of sales (www.tsurumi-europe.com/english/GCS.htm) that we also send to you by mail on request.

Volme Gallery at Town hall, Hagen



The Project:

Construction of the Volme Gallery at the Town hall in Hagen, Germany

Executing company:

Wiemer & Trachte AG, Dortmund

The Problem:

Pumping off the ground water via open dewatering.



Our Solution:

The groundwater generated is pumped off by several submersible pumps for dirty water. 24-h on-shore-operation must be ensured.

A total of twelve KTZ31.5 and five KTZ45.5 was in operation.

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Mobile truck washing station



The Project:

Operation of a mobile truck washing station

Executing company:

Scherer Umweltschutztechnik, Wuppertal, Germany

The Problem:

Due to the low height of the construction of the water tank, the submersible pumps must be installed in horizontal position.

Our Solution:

Operation of the plant using three KTZ45.5. Due to their quality features, Tsurumi pumps can be operated in horizontal position in any case. This is ensured by high-quality ball bearings and a double inside mechanical seal of silicon carbide. The patented oil lifter provides sufficient lubrication and cooling of the mechanical seal when operated in horizontal position.



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Rheinische Zusatzversorgungskasse Cologne-Deutz



The Project:

Construction of new administration building for Rheinische Zusatzversorgungskasse, Cologne-Deutz, Germany

Executing company:

Züblin Spezialtiefbau, Duisburg

The Problem:

Surface water collected in the reinforcement system of a foundation, several shafts are filled with water. The spacing between the reinforcement is 40mm only.

Our Solution:

LSC-4 SP self-priming design. Minor modification to the residue water pump LSC-4 the latter could be operated in self-priming mode. The intake hose is lowered in the shaft through the reinforcement system. When filled, LSC-4 is always self-priming and can also be used in on-shore operation.



In the event of abrasive and corrosive utilization, stronger wear and tear will take place naturally in certain components. With regards to the above application wear and tear can take place mainly in impeller, suction plate, shaft sleeve, oil ring, mechanical seal and pump casing. Depending on the working conditions the lifetime of those parts might vary significantly and can be shorter than the legal warranty period.

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Extension of connection road L639, Gelsenkirchen



The Project:

Extension of the connection road L639,
Florastraße Gelsenkirchen

Executing company:

Heitkamp Erd- u. Straßenbau GmbH

The Problem:

Repumping a mixed water channel because a shaft had to be installed.

Our Solution:

Two Tsurumi KRS82 pumped off the dammed water. 720m³/h were re-passed into the mixed water channel at a distance of 100m. This took 3 weeks where the pumps were in service 24h a day without any failure. The pumps were laid into the bed of the channel without further installation. No problem for Tsurumi pumps.



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Kumm Fertigbeton



Sludge and water are returned to the concrete production plant via a pump.

Our Solution:

Two KTZ35.5 pump the recycling water containing cement sludge back to the mixing plant. The pumps are in operation for 8h a day, mostly in on-shore-mode.

The Project:

Recycling basin of a ready-mix concrete plant.

Executing company:

Kumm Fertigbeton GmbH

The Problem:

The concrete mixing trucks are cleaned with water which is collected in the recycling basin where cement sludge settles.



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Quartz sand works M. Tebbe-Neuenhaus



The Project:

Generation of quartz sand

Executing company:

**Quarzwerk M. Tebbe-Neuenhaus,
Bottrop-Kirchhellen**

The Problem:

The quartz sand has to be washed during extraction. Highly abrasive washing water should be expected here.

Our Solution:

Three KTZ67.5 and KTZ45.5 each are used as supply pumps for washing water. The KTZ-series made of cast iron is characterised by long service life even under excessively wearing media. The double inside mechanical seal does not contact the medium; the chromium portion of the impeller is 25%.



top: Water reservoir

left: Return flow



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ICE railway station Cologne-Bonn Airport



The Project:

ICE railway station Cologne-Bonn Airport lot C, Germany

Complete dewatering (24h duty) carried out by:
Biergans Pumpen-Vertrieb GmbH, Duisburg

The Problem:

Open dewatering using submersible pumps.

Our Solution:

Draining the excavation pit at the head and tail structure.

Currently, one KTV2-37, three KTZ32.2 and two KTZ67.5 are in continuous operation.



Exit of railway station
KTZ67.5 horizontal position, 24h on-snore-mode



Exit of railway station
KTZ67.5, 24h on-snore-mode



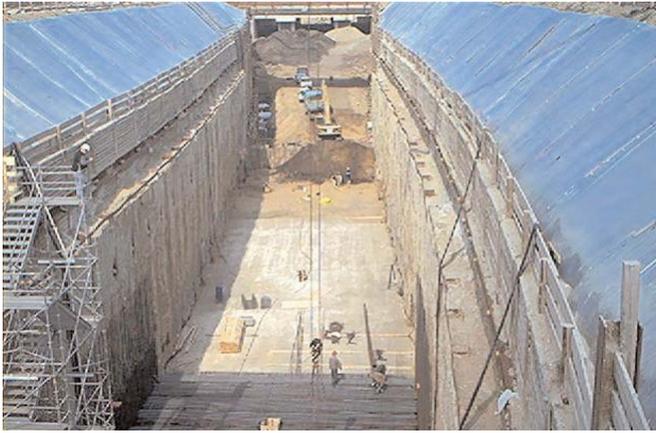
Entrance of railway station
KTZ67.5, 24h on-snore-mode



Entrance of railway station
KTZ67.5 in continuous operation

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ICE railway track Cologne-Bonn Airport



The Project:

Underground railway track to link the Cologne-Bonn airport, Germany.

Executing companies:

Consortium Airport tunnel Cologne-Bonn lot 3
Wayss & Freytag Ingenieurbau AG,
E. Heitkamp GmbH, F.C. Trapp AG

Complete dewatering (24 h duty) carried out by:
Smet GWT N.V., Dessel, Belgium
Biergans Pumpen-Vertrieb GmbH, Duisburg, Germany

The Problem:

Open dewatering by means of submersible pumps.

Our Solution:

The groundwater generated is pumped off by several submersible pumps for abrasive water. 24-h on-shore-operation must be ensured. Currently a total of twenty KTZ21.5 and ten KTZ32.2 is in operation.



View to the railway track in direction of ICE station



KTZ21.5 - well pots with submersible pumps



Well pot with KTZ32.2



KTZ21.5 - dewatering by a drainage system



KTZ21.5 - dewatering and drainage collection system



KTZ21.5 - installed in a drainage system to dewater the railway track



KTZ32.2 - dewatering in front of the existing tunnel entrance



KTZ21.5 - horizontal, in on-shore-mode



LB2-400 - minor dewatering when sealing the walls by means of small 1-phase submersible pump



LSC-4 residual water pump

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August, 19 - 31:

First trial for the Tsurumi pumps at the rivers Elbe, Sieg und Rhein (Germany)

Shortly prior to leaving for fighting the century flood at the river Elbe, the local association Cologne East was able to procure two Tsurumi pumps within as short a period as 24 h, while the purchase was planned since November 2001. On receipt of the order on Friday noon at Tsurumi's, the two electrical submersible pumps **KRS-63** (200 l/min at a delivery head of 5 m, and 3,5 kW input power) were transported from the import warehouse in Antwerp to Düsseldorf, provided there with Storz couplings and protective motor switches, and - Saturday, shortly before 8 o'clock in the morning, Stefan Himmelsbach, sales manager with Tsurumi Germany, personally brought the pumps to the local association. In the area of service, Stendal, THW received the pleasant notice that Messrs. Tsurumi provided another four electrical submersible pumps type **KRS2-100** (1500 l/min at a delivery head of 10 m and 6,9 kW input power with agitator, specifically to delivery sludge, silt and Bentonit), which were to be supplied to the place of service as soon as possible.



August 24-26: Century flood at the river Elbe

The pumps passed their first trial in Magdeburg. The horse racecourse Herrenkrug was flooded after a dyke blow and the water collected there penetrated the basements of neighbouring buildings. Over night the pump team consisting of helpers of the Cologne East and Cologne North W est local associations and the Magdeburg town works were able to considerably lower the water level and to pass the water back to the sinking Elbe.



Typical "conditions of work" for submersible pumps during THW services:

Dirty sludge water, delivering in semi horizontal position and in sipping mode – this requires really sturdy pumps.

August 28, 2002: Tempest in the Rhine/Sieg district

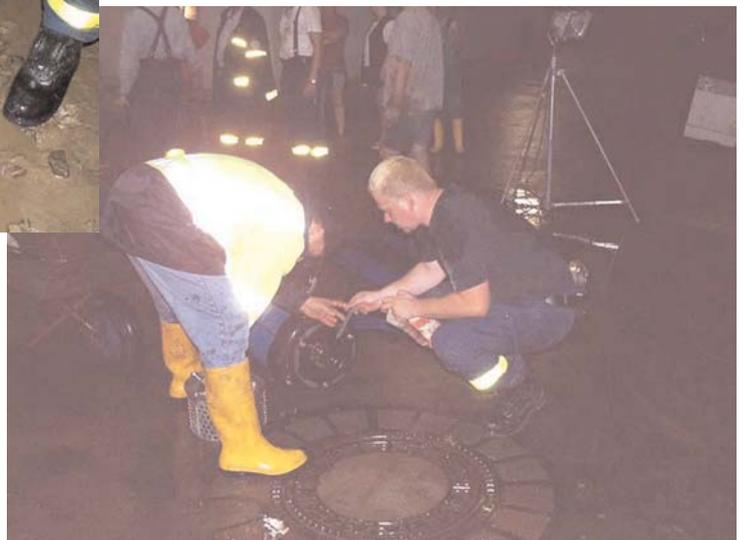
Monday still in service in Magdeburg, the next tempest waited already at home. Early on Wednesday evening, a serious thunderstorm raged in the Rhine/Sieg District, which resulted – after excessive rainfalls in Eitorf-Bach – to the flooding of basements and living rooms.



The water could be pumped off by means of the efficient pumps within the shortest possible time.



Fixed with three screws, the intake basket can be removed in order to reach low water levels.



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August 31, 2002: Flooding in the Federal Property Administration, Cologne, Germany

This was the week of pump services. Saturday, August 31, the basement in the bunker Cologne-Flittard was pumped empty as an official assistance for the Federal Property Administration, so that the basement could be cleared of rubbish. No problem for the Tsurumi KRS-63 with its 2000 l/min and a power input of 3,5 kW, which can be operated together with a 1000 W flood light reflector at the generator 5 kVA without difficulty.



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Latest Technology and Highest Quality

A - Tsurumi stuffing box - absolutely watertight



The stuffing box is located at the cable entry section and takes the part of sealing of water. As the cable conductors consist of twisted wires, water may penetrate into the motor by the capillary phenomenon when cable sheath or insulation is damaged or when the end of the cable is submerged. The construction is such that a certain part of the insulation of each conductor is peeled and filled with rubber or epoxy resin for the complete sealing.

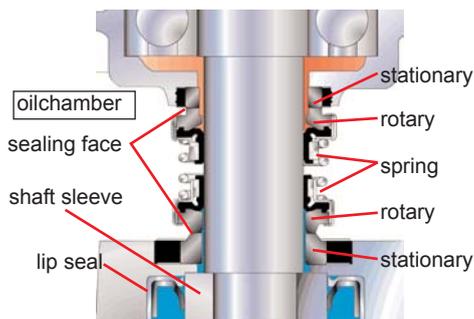
B - Continuous use under dry run ("on snore")

Located directly above the motor windings, a snap-action self-resetting bi-metal device cuts off voltage from all three phase windings simultaneously if the current is too large in one, two or all three windings, or if the windings get too hot.

Tsurumi enables measurement of winding resistance and insulation from the far end of the cable, without ever removing the cover from the motor in the field.

C - Double mechanical seal in oil bath

All Tsurumi pumps dispose of a double sealing systems for extended lifetime:



1. A shaft sleeve in connection with a special lip seal protects the mechanical seal from particles - abrasive particles are expelled back into the flow - they don't have contact with the mechanical seal at all !!

2. All Tsurumi contractors' pumps - even the 400W class - have double mechanical seals inside an oil both. The seal material is Silicon Carbide - no other has greater hardness. Resistance to temperature fluctuation and corrosion is also the best available.

D - Increased wear resistance of pump casing and impeller

As contractors' pumps are used in unpredictable circumstances, Tsurumi has gone a long way towards making the impeller capable of the impossible and towards providing spare motor power to match.

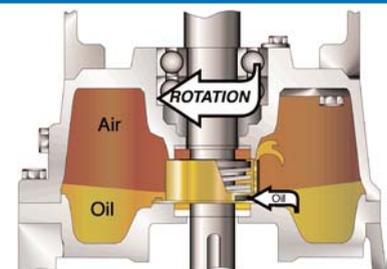
Tsurumi contractors' pumps are used extensively for bentonite mud, often with earth in the case of the models fitted with an agitator.

E - Ball bearings of highest quality

Due to the high quality of the shaft and the bearings all pumps can be run horizontally when entirely submerged.

Oil Lifter

A special patented guide vane is attached inside the oil chamber. With the motor rotation oil is pumped up. Therefore even at low oil level lubrication and cooling of the mechanical seal is secured.



We reserve the right to change specifications and designs herein for improvement without prior notice. Our pumps are for professional use only. In the event that Tsurumi (Europe) GmbH have, in exceptional cases taken over, a manufacturer's warranty, this entitles the end-user to assert remedy free of charge against Tsurumi (Europe) GmbH due to any defect to the product occurring during the guarantee period (see below), also then when the warranty claims against the seller do not or no longer exist. In the event of malfunction, which is attributable to the improper handling by the enduser, no guarantee claim shall arise. Further claims shall not result from the warranty, unless if something to the contrary has explicitly been determined. The decision as to whether remedy is effected by way of replacement or repair shall be at the choice of Tsurumi (Europe) GmbH. The claims shall be time barred after a period of three months after expiry of the guarantee period, however, not before expiry of the warranty period which is valid towards the seller. In the event of doubt, the warranty period shall correspond with the warranty period which is valid between the end-user and his seller.

Tsurumi (Europe) GmbH

Heltorfer Straße 14
D-40472 Düsseldorf

Tel.: +49-211-4179373
Fax: +49-211-4791429

vertrieb@tsurumi-europe.com
www.tsurumi-europe.com